

Subject: MSD Colloquium - NOTE LOCATION CHANGE - Aug. 3, 11am, 200, AUDITORIUM
From: Janice Coble <coble@anl.gov>
Date: Thu, 13 Jul 2006 15:57:57 -0500
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MATERIALS SCIENCE DIVISION COLLOQUIUM

SPEAKER: DR. VLADIMIR KOMANICKY
Materials Science Division
Argonne National Laboratory

TITLE: Model Systems in Electrocatalysis: Let's Get Real

DATE: Thursday, August 3, 2006

TIME: 11:00 a.m.

PLACE: Building 200, AUDITORIUM

HOST: Paul Fuoss

Refreshments will be served at 10:45 a.m.

Abstract: Metal nanoparticles have been extensively used in electronics, magnetic devices, gas sensing and catalysis. Platinum group metals and their alloys with transition metals are especially important in electrocatalysis. Many reactions catalyzed by these metals exhibit sensitivity on the particular crystallographic orientation of the catalyst particle surfaces. When size of the nanoparticle falls below certain limit, the contribution of its edges and corners to overall catalytic activity becomes significant. The above mentioned raises a question of particle "shape effect" and "size effect", which has still not been ultimately answered because the real nanoparticle catalysts are usually not well defined and sufficiently clean. Instead, traditional single crystal surfaces are used, since they can be prepared in a clean and well defined manner. I will talk about three model systems in electrocatalysis namely: single crystal surfaces, nanofaceted surfaces and nanoparticle arrays. Two latter mentioned systems are our attempt to evolve from a traditional single crystal model systems into ones where intrinsic properties of nanoparticles, such as a presence of corners and edges, are incorporated. I will describe a preparation and characterization of these novel systems. In addition I will discuss several examples of utilizing some of above mentioned model systems to investigate issues relevant to operation of polymer electrolyte fuel cells.